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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/646,809	08/25/2003	Thomas J. Kelly	08350.3304-03	1320

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EXAMINER	
PARK, JEONG S	

ART UNIT	PAPER NUMBER
2154	

MAIL DATE	DELIVERY MODE
08/10/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

MN

Office Action Summary	Application No.	Applicant(s)	
	10/646,809	KELLY ET AL.	
	Examiner	Art Unit	
	Jeong S. Park	2154	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 June 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-38* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-38* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 June 2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This action is in response to communications filed on June 16 2007.

Claim Objections

2. Claims 1-38 are objected to because of the following informalities:

In claim 1, line 3, the word "a environment" should be corrected as –an environment--. Similar correction should be made for claims 13, 25, 26 and 38; and

In claim 27, line 1, the phrase "the computer-readable medium" should be corrected as –the computer-readable storage device-- for clear understanding of the claim. Similar correction should be made for claims 28-37.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-9, 11, 13, 14, 16-19, 21-34, 36 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over IEEE Conference Proceeding (hereinafter IEEE)(Ad-hoc on-demand distance vector routing by Perkins et al., published in Mobile Computing Systems and Applications, 1999 Proceedings, WMCSA "99 Second IEEE Workshop on 25-26 February 1999, Pages: 90-100) in view of Hopper et al. (hereinafter Hopper)(U.S. Patent No. 7,177,652 B1).

Regarding claims 1, 26 and 38, IEEE discloses as follows:

The claimed inventive concept of dynamically establishing an ad-hoc network including a plurality of mobile nodes refers to laptop computers (Ad-hoc On Demand Distance Vector Routing (AODV) is an algorithm for the operation of an ad-hoc network which is the cooperative engagement of a collection of mobile nodes, see, e.g., abstract, lines 1-6), one or more of which may move within a work environment (a collection of mobile nodes) and each of which includes a gateway (each mobile host operates as a specialized router which functions as a gateway, see, e.g., Abstract, lines 6-9), the method performed by a respective gateway included within a respective one of the work machines comprising:

A gateway with a first interface connected to an on-board data link and a second interface connected to an off-board data link (mobile host operates as a router, which means one data link through a interface to other router for network connections and another data link through another interface to the upper layer, which handles an application layer as a network host, see, e.g., page 1, Abstract);

A network table (each mobile node maintains a route table which includes destination and next hop, which means a packet is routed to the next hop, which has connection to the destination, based on the destination information, see, e.g., page 4, section 2.2, third paragraph);

Determining a first set of the plurality machines within direct communication range of the respective work machine (mobile node)(nodes learn of their neighbors, see, e.g., page 5, section 2.4, lines 1-4);

Determining a second set of work machines in direct communication range of one or more of the work machines in the first set (all intermediate nodes between destination and source nodes, shown on Figure 2, know the forward and reverse path, see, e.g., page 3, section 2.1.2, paragraph 2);

Forwarding a packet received from a first work machine to a third work machine (forwarding a packet from a node to the other node based on the route determined by determining step above, see, e.g., Figure 2, page 3, section 2.1.2, second paragraph, and page 4, section 2.2, second paragraph); and

Updating the polarity of machines based on changes (updating local connectivity of mobile nodes' information, see, e.g., page 5, section 2.4, first paragraph, and path maintenance, see, e.g., page 4, section 2.3, first paragraph).

IEEE does not explicitly disclose determining the second set of machines based on the machine's current location and updating the machines based on the changing locations.

Hopper discloses as follows:

A wireless device for use in an ad-hoc network including a transceiver, a global positioning system and a controller (see, e.g., abstract, line 1-3 and figure 2);

Determining a pro-active region and reactive region of the ad hoc network based upon the positional information of each user from GPS system (see, e.g., col. 4 line 41 to col. 5, line 14);

Determining a pro-active region and reactive region of the ad hoc network based upon the number of hops to communicate between wireless devices (pro-active region

for within 2 hops and reactive region for more than two hops, see, e.g., col. 1, lines 47-60);

Updating positional information on the users in the pro-active region (see, e.g., col. 6, lines 10-20);

Each user receives current position information from other devices in the area and the current position information is used to update a table of those users determined to be in the pro-active region (see, e.g., col. 4, lines 41-46);

It would have been obvious for one of ordinary skill in the art at the time of the invention to modify IEEE to include GPS system to update positional information of each user and determining pro-active and reactive region based on the updated positional information, as taught by Hopper in order to discover a route and communicate through the discovered route in terms of the locations of the users in the mobile ad-hoc network.

Regarding claims 2, 3, 22-24, 27 and 28, IEEE discloses forwarding a packet to the destined or any work machine via second and third work machines based on the determination achieved by the claim 1 (sending data transmission after determining a route from source to destination node based on the route table in each node, see, e.g., page 3, third paragraph, page 4, section 2.2, third paragraph).

Regarding claims 4, 5, 16, 17, 29 and 30, IEEE discloses broadcasting an admission packet (hello message) periodically (within hello-interval), receiving or collecting a response, and adding at work machines (nodes) based on the received response (broadcasting a hello message to all its neighbors periodically within hello-

interval in order to update their local connectivity information to each node, see, e.g., page 5, section 2.4, first paragraph).

Regarding claims 6-9, 14, 18, 19 and 31-34, IEEE discloses updating the respective work machine periodically based on the location and removing any work machines not in direct communications with any work machines (Each node broadcasts a hello message to its neighbors periodically within hello-interval so all nodes are updated their current locations periodically which includes removing old nodes and adding new nodes, see, e.g., page 5, section 2.4, first paragraph).

Regarding claims 11 and 36, IEEE discloses forwarding a destined packet to the second work machine based on the first network table (each mobile node maintains a route table which includes destination and next hop, which means a packet is routed to the next hop, which has connection to the destination, based on the destination information, see, e.g., page 4, section 2.2, third paragraph).

Regarding claims 13 and 25, IEEE discloses as follows:

A system for dynamically establishing communications between a plurality of machines (a collection of mobile nodes), one or more of which may move within an environment (see, e.g., abstract, lines 1-6), the system comprising:

A first machine positioned in a first location within the environment, a first gateway included in the first machine that connects an on- board data link with an off-board data link (mobile host operates as a router, which means one data link through a interface to other router for network connections and another data link through another interface to the upper layer, which handles an application layer as a network host, see,

e.g., page 1, Abstract);

A network table included in the first gateway that identifies machines that are either directly or indirectly within communication range of the first machine, wherein the network table identifies a first set of the plurality of machines that are within communication range of the first machine and identifies a second set of the plurality of machines that are within communication range of any of the machines in the first set (each mobile node maintains a route table which includes destination and next hop, which means a packet is routed to the next hop, which has connection to the destination, based on the destination information, see, e.g., page 4, section 2.2, third paragraph);

Receive a packet over the off-board data link from a second machine included in the first set, wherein the packet identifies a destination machine (forwarding a packet from a node to the other node based on the route determined by determining step above, see, e.g., Figure 2, page 3, section 2.1.2, second paragraph, and page 4, section 2.2, second paragraph);

Forward the received packet to a third machine included in the first set based on a determination that the destination machine is associated with the third machine in the network table (forwarding a packet from a node to the other node based on the route determined by determining step above, see, e.g., Figure 2, page 3, section 2.1.2, second paragraph, and page 4, section 2.2, second paragraph); and

Send information included in the received packet to the on-board data link when the packet identifies the first machine as the destination machine (mobile host operates

as a router, which means one data link through a interface to other router for network connections and another data link through another interface to the upper layer, which handles an application layer as a network host, see, e.g., page 1, Abstract).

IEEE does not explicitly disclose updating the machines based on the changing locations.

Hopper discloses as follows:

A wireless device for use in an ad-hoc network including a transceiver, a global positioning system and a controller (see, e.g., abstract, line 1-3 and figure 2);

Determining a pro-active region and reactive region of the ad hoc network based upon the positional information of each user from GPS system (see, e.g., col. 4 line 41 to col. 5, line 14);

Determining a pro-active region and reactive region of the ad hoc network based upon the number of hops to communicate between wireless devices (pro-active region for within 2 hops and reactive region for more than two hops, see, e.g., col. 1, lines 47-60);

Updating positional information on the users in the pro-active region (see, e.g., col. 6, lines 10-20);

Each user receives current position information from other devices in the area and the current position information is used to update a table of those users determined to be in the pro-active region (see, e.g., col. 4, lines 41-46); and

It would have been obvious for one of ordinary skill in the art at the time of the invention to modify IEEE to include GPS system to update positional information of

each user, as taught by Hopper in order to discover a route and communicate through the discovered route in terms of the locations of the users in the mobile ad-hoc network.

Regarding claim 21, IEEE discloses translating the information in a received packet to an on-board data link (mobile host, as well known within the art, handles an application layer as a network host, so if the packet is destined to that host, then it will process the packet to upper layer with an accepted format to the upper layer, see, e.g., page 1, Abstract).

5. Claims 10, 12, 15, 20, 35 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over IEEE Conference Proceeding (hereinafter IEEE)(Ad-hoc on-demand distance vector routing by Perkins et al., published in Mobile Computing Systems and Applications, 1999 Proceedings, WMCSA "99 Second IEEE Workshop on 25-26 February 1999, Pages: 90-100) and Hopper et al. (hereinafter Hopper)(U.S. Patent No. 7,177,652 B1) in view of Computer Networks a Systems Approach Section 4.2.2 (by Larry L. Peterson et al., 2dn edition, pages 284-288, published by Morgan Kaufmann Publishers, on October 1999).

Regarding claims 10, 20 and 35, IEEE and Hopper teach all the limitations as disclosed above except for selecting one of the at least two data links to forward the packet based on of an availability status of each of the data links.

The general concept of selecting a link among multiple links based on an availability status is well known within the art as illustrated by Computer Networks a Systems Approach Section 4.2.2, which discloses as follows:

Availability status of each of data links (containing the distances (costs) to all other nodes, see, e.g., page 284, section 4.2.2, first paragraph, Figure 4.14, Table 4.6 on page 285);

Initial distances stored at each node (each node knows all connections to its neighbors, see, e.g., page 284, third paragraph, Figure 4.14, Table 4.5 on page 285);

An initial routing table from the step of exchanging its personal list of distances between its directly connected neighbors (see, e.g., page 285, first paragraph, Table 4.5, Figure 4.14); and

A final routing table resulted from a few exchanges of the information between neighbors (see, e.g., page 286, first and second paragraph, Table 4.7 and 4.8, Figure 4.14).

It would have been obvious for one of ordinary skill in the art at the time of the invention to modify IEEE and Hopper to include the distance vector routing concept, as taught by Computer Networks a Systems Approach Section 4.2.2 in order to use link costs as an availability status to select among multiple links.

Regarding claims 12, 15 and 37, IEEE and Hopper teach all the limitations as disclosed above except for building and using two network tables to forward a packet to a destination.

The general concept of building and using routing tables is well known within the art as illustrated by Computer Networks a Systems Approach Section 4.2.2 which discloses as follows:

Initial distances stored at each node (each node knows all connections to its neighbors, see, e.g., page 284, third paragraph, Figure 4.14, Table 4.5 on page 285);

An initial routing table from the step of exchanging its personal list of distances between its directly connected neighbors (see, e.g., page 285, first paragraph, Table 4.5, Figure 4.14); and

A final routing table resulted from a few exchanges of the information between neighbors (see, e.g., page 286, first and second paragraph, Table 4.7 and 4.8, Figure 4.14).

It would have been obvious for one of ordinary skill in the art at the time of the invention to modify IEEE and Hopper to include a routing table which includes all direct and indirect connections for each node, as taught by Computer Networks a Systems Approach Section 4.2.2 in order to simplify the routing process.

Response to Arguments

6. Applicant's arguments filed 6/16/2007 with respect to claims 1, 13, 25 and 26 have been considered but are moot in view of the new ground(s) of rejection.

A. Summary of Applicant's Arguments

In the remarks, the applicant argues as followings:

1) Claim 1, determining a second set of the plurality of machines that are in direct communication range of one or more of the machine in the first set; and

2) Claim 1, updating a computer-readable storage device of the machines included in at least one of the first and second sets of the plurality of machines.

B. Response to Arguments

In response to argument 1) and 2), Claims 1, 13, 25, 26 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over IEEE Conference Proceeding (hereinafter IEEE)(Ad-hoc on-demand distance vector routing by Perkins et al., published in Mobile Computing Systems and Applications, 1999 Proceedings, WMCSA "99 Second IEEE Workshop on 25-26 February 1999, Pages: 90-100) in view of Hopper et al. (hereinafter Hopper)(U.S. Patent No. 7,177,652 B1).

Hopper discloses as follows:

A wireless device for use in an ad-hoc network including a transceiver, a global positioning system and a controller (see, e.g., abstract, line 1-3 and figure 2);

Determining a pro-active region (first set) and reactive region (second set) of the ad hoc network based upon the positional information from GPS system (see, e.g., col. 4 line 41 to col. 5, line 14);

Determining a pro-active region (first set) and reactive region (second set) of the ad hoc network based upon the number of hops to communicate between wireless devices (pro-active region for within 2 hops and reactive region for more than two hops, see, e.g., col. 1, lines 47-60);

Updating positional information on the users in the pro-active region (see, e.g., col. 6, lines 10-20); and

Each user receives current position information from other devices in the area and the current position information is used to update a table of those users determined to be in the pro-active region (see, e.g., col. 4, lines 41-46).

It would have been obvious for one of ordinary skill in the art at the time of the invention to modify IEEE to include GPS system to update positional information of each user and determining pro-active and reactive region based on the updated positional information, as taught by Hopper in order to discover a route and communicate through the discovered route in terms of the locations of the users in the mobile ad-hoc network.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeong S. Park whose telephone number is 571-270-1597. The examiner can normally be reached on Monday through Thursday 7:30 - 5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on 571-272-1915. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JP

July 25, 2007

NATHAN FLYNN
SUPERVISORY PATENT EXAMINER